TAMPERE UNIVERSITY OF TECHNOLOGY

This certificate is an official English version of the original issued in the Finnish language

CERTIFICATE

Heidi Susanna Hakala

(born 14 October 1976)

has passed all the examinations towards the degree of

MASTER OF SCIENCE (TECHNOLOGY)

in Electrical Engineering degree programme

The degree consists of the following studies:

Basic studies	
Major	Medical Informatics
Minor	Industrial Management

Degree Thesis "Analyzer Monitoring System of Clinical Laboratory" passed with grade "good".

Examiner Professor Jari Hyttinen

The total scope of degree is 184 credits, passed with grade average "very satisfactory".

The courses completed in other institutes:
3 credits, Tampereen yliopisto

The conferee received his/her pre-university education in the Finnish language, written the maturity test in Finnish as required for this degree, and passed the written and oral examination in the second native language Swedish. Passing the University´s examination in the second native language authenticates the language proficiency stipulated for civil servants in a bilingual administrative area.

Tampere, May 7 2008

Dean Ulla Ruotsalainen

Head of degree Programme Seppo Valkealahti

TAMPERE UNIVERSITY OF TECHNOLOGY

Certificate nr 14862
Appendix: Transcript of records

TAMPERE UNIVERSITY OF TECHNOLOGY

TRANSCRIPT OF RECORDS

07.05.2008

Hakala, Heidi Susanna
born: 14.10.1976

Degree Programme in Electrical Engineering

COURSES COMPLETED	CR	CU	GRADE	LECTURER
Biomedical Engineering	**4.0**	**0.0**		
Biomedical Engineering Project	4.0		pass	Nousiainen Juha
Institute of Biomedical Engineering		**25.0**		
Medical Device Regulations		2.0	4	Kolari Pertti
Introduction to Medical Informatics		4.0	2	Nousiainen Juha
Basics of Telemedicine		1.0	pass	Nousiainen Juha
Seminar on Neuroinformatics		1.0	pass	Malmivuo Jaakko
Human Anatomy and Physiology		4.0	3	Oja Sakari
Biomedical Engineering and Physiological Measurements		3.0	2	Nousiainen Juha
Introduction to Small-signal Instrumentation		2.0	1	Nousiainen Juha
Biomedical Engineering Laboratory Course 1		2.0	pass	Viik Jari
Biomedical Engineering Laboratory Course 2		2.0	pass	Viik Jari
Modelling of Physiological Systems		3.0	4	Hyttinen Jari
Seminar on Biomedical Engineering		1.0	pass	Viik Jari
Institute of Communications Engineering		**3.0**		
Introduction to Telecommunications		3.0	2	Uotila Pekka
Institute of Electromagnetics	**15.0**	**0.0**		
Circuit analysis I	5.0		1	Mikkonen Risto
Electromagnetic fields and waves I	5.0		1	Kettunen Lauri
Electromagnetic fields and waves II	5.0		1	Suuriniemi Saku
Institute of Electronics		**5.0**		
Basic Electronics I		2.0	1	Ilmonen Matti
Basic Electronics II		3.0	2	Kivikoski Markku
Institute of Industrial Management	**3.0**	**31.0**		
Introduction to office softwares		1.0	pass	Repo Santeri
Basic Course in Economics		2.0	2	Karppinen Ari
Project management		2.0	3	Ojala Mika
Financial Management in Non-Profit Organization		1.0	3	Linden Mikael
Production Management		3.0	3	Pirjetä Markku
Quality Management		2.0	3	Annala Jukka
Advanced Topics in Quality Management		3.0	3	Pirjetä Markku
Business Economics		2.0	1	Uusi-Rauva Erkki
Marketing		3.0	2	Mahlamäki Tommi
Speech Communication and Negotiation Skills I		1.0	3	Lepomäki Tapani
Corporate Organisations and Leadership		2.0	3	Laukkanen Seppo
Human Resource Management		3.0	4	Miettinen Asko

TAMPERE UNIVERSITY OF TECHNOLOGY

TRANSCRIPT OF RECORDS

Hakala, Heidi Susanna
born: 14.10.1976

COURSES COMPLETED	CR	CU	GRADE	LECTURER
Institute of Industrial Management				
Strategic Human Resource Management		3.0	3	Miettinen Asko
Introduction to Industrial Management		3.0	2	Rantanen Eeva
Technology Management	3.0		5	Nokelainen Tomi
Institute of Machine Design		**2.0**		
Electrical Drawing		2.0	3	Alanko Risto
Institute of Materials Chemistry		**8.0**		
General and Inorganic Chemistry		3.0	3	Kellomäki Aarre
Laboratory Safety and Methods of Work		1.0	pass	Mikkonen Raija
Organic Chemistry		2.0	2	Kellomäki Aarre
Organic Chemistry II		2.0	3	Kellomäki Aarre
Institute of Mathematics		**19.0**		
Engineering Mathematics 1		5.0	1	Lätti Isto
Engineering Mathematics 2		5.0	1	Pirttimäki Erkki
Mathematics for Algorithms		3.0	1	Lätti Isto
Introduction to Hypermedia		3.0	4	Nykänen Ossi
Structured Documents		3.0	3	Nykänen Ossi
Institute of Measurement and Information Technology		**3.0**		
Measurement Technology		3.0	3	Jokinen Heikki
Institute of Occupational Safety Engineering		**2.0**		
Introduction to Safety Engineering		2.0	3	Hämäläinen Päivi
Institute of Physics	**8.0**	**6.0**		
Fundamental University Physics Part I		4.0	1	Valden Mika
Physics Laboratory I		2.0	3	Valjakka Jukka
Fundamental Physics for Engineers Part 2	8.0		1	Kaukasoina Petri
Institute of Power Engineering		**4.0**		
Introduction to Power Engineering		4.0	2	Keikko Tommi
Institute of Signal Processing		**3.0**		
Microprocessors		3.0	1	Poiksalo Panu-Kristian
Institute of Software Systems		**13.0**		
Computer Literacy		2.0	1	Karjalainen Peter
Programming I		3.0	1	Suntioinen Ari
Software Engineering Methodology		4.0	3	Haikala Ilkka
Introduction to Software Engineering		2.0	3	Haikala Ilkka
Usability		2.0	5	Vilpola Inka
Mathematics	**3.0**	**0.0**		
Vector Analysis	3.0		1	Pirttimäki Erkki

TAMPERE UNIVERSITY OF TECHNOLOGY

TRANSCRIPT OF RECORDS

Hakala, Heidi Susanna
born: 14.10.1976

07.05.2008

COURSES COMPLETED	CR	CU	GRADE	LECTURER
TUT Language Centre		**10.0**		
Basic English		2.0	2	Donoghue Danny
Advanced General English		2.0	2	Karo Anni
Basic Swedish		2.0	3	Lappalainen Päivi
Italian for Beginners		4.0	pass	Fornaciari Aimone
Other studies	**5.0**	**0.0**		
Other studies	5.0		pass	Tampereen yliopisto
Other studies		**8.0**		
Practical training		8.0	pass	...
Total:	**38.0**	**142.0**		
Transferred to credit units:		**164**		

Hannele Kulmala
Registrar

TAMPERE UNIVERSITY OF TECHNOLOGY

The extent of the studies is measured by credit units (CU) and credits (CR). During one academic year an average of 1600 hours work load is required equalling to 60 credits. One credit unit refers to 40 hours of academic work. Scale of grades: excellent (5), very good (4), good (3), very satisfactory (2), satisfactory (1) or pass (approved). Studies at other institutions of higher education are accepted to the degree with the grade pass (approved).

TAMPERE UNIVERSITY OF TECHNOLOGY

DIPLOMA SUPPLEMENT

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of this supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.) It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free of any value-judgements, equivalence statements or suggestions about recognition. Information should be provided in all eight sections. Where information is not provided, a reason should be given.

1 INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

1.1.	Family name(s)	Hakala
1.2.	Given name(s)	Heidi Susanna
1.3.	Date of birth	October 14, 1976
1.4.	Student identification number	160630

2 INFORMATION IDENTIFYING THE QUALIFICATION

2.1.	Name of qualification and (if applicable) title conferred (in original language)	**diplomi-insinööri**
2.2.	Main field(s) of study for the qualification	Information Technology
2.3.	Name and status of awarding institution	Tampereen teknillinen yliopisto, Tampere University Technology, state recognised university, Decree on Higher Education Degree Structure 464/1998 (including amendments)
2.4.	Name (in original language) and status of institution (if different from 2.3) administering studies	not applicable
2.5.	Language(s) of instruction/ examination	Finnish

3 INFORMATION ON THE LEVEL OF THE QUALIFICATION

3.1.	Level of qualification	See 8. Higher academic degree/second-cycle university degree
3.2.	Official length of programme	the degree consists of at least 180 credits, appr. 5 years of full-time study
3.3.	Access requirements	See 8.

4 INFORMATION ON THE CONTENTS AND RESULTS GAINED

4.1.	Mode of study	full-time
4.2	Programme requirements	See transcript of records
4.3.	Programme details	See transcript of records
4.4.	Grading scheme	See transcript of records
4.5.	Overall classification of the qualification	Not applicable

5 INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1.	Access to further study	Eligible for doctoral studies
5.2.	Professional status	Under the Finnish legislation, a person who has taken **diplomi-insinööri** is qualified for posts or positions in the public sector for which the qualification requirement is a second-cycle academic degree. The second -cycle university degree of diplomi-insinööri is also accepted as a requirement for a professional career. In some cases, the qualification requirement also includes the completion of studies in certain specified fields of study. The degree falls under the Council Directive 89/48/EEC of 21 December 1988 on a general system for the recognition of higher education diplomas awarded on completion of professional education and training of at least three years' duration.

6 ADDITIONAL INFORMATION

6.1.	Additional information	-
6.2.	Further information sources	http://www.tut.fi, http://www.minedu.fi, Ministry of Education, http://www.oph.fi/info/recognition, The Finnish National Board of Education.

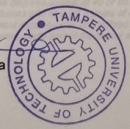
7 CERTIFICATION OF THE SUPPLEMENT

7.1. Date 7.5.2008

7.2. Signature

7.3. Capacity Hannele Kulmala
Secretary

7.4. Official stamp or seal



8 INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM

The Finnish education system consists of basic education, general and vocational upper secondary education, higher education and adult education. The basic education consists of a 9-year compulsory school for all children from 7 to 16 years of age.

Post-compulsory education is given by general upper secondary schools and vocational institutions. The general upper secondary school provides a 3-year general education curriculum, at the end of which the pupil takes the national Matriculation examination (ylioppilastutkinto/studentexamen). Vocational institutions provide 3-year programmes, which lead to upper secondary vocational qualifications (ammatillinen perustutkinto/yrkesinriktad grundexamen).

General eligibility for higher education is given by the Matriculation examination or the upper secondary vocational qualification. These qualifications require at least 12 years of schooling. Equivalent foreign qualifications also give general eligibility for higher education.

The Finnish higher education system comprises 20 universities (yliopisto/universitet) and 29 polytechnics (ammattikorkeakoulu, AMK/yrkeshögskola, YH). Ten of the universities are multi-faculty universities and ten are specialised institutions. All universities engage in both education and research and have the right to award doctorates. The polytechnics are multi-field institutions of professional higher education. Polytechnics engage in applied research and development.

Higher education studies are measured in credits (opintoviikko/studievecka) with one credit defined as the amount of work required from the student to attain the required objectives. One credit corresponds to approximately 40 hours of student work.

University degrees

There are field-specific national decrees on university degrees defining the objectives, extent and overall structure of degrees. The universities decide on the detailed contents and structure of the degrees they award. They also decide on their curricula and forms of instruction.

The extent of the first-cycle university degree is a minimum of 120 credits (3 years of full-time study). This degree is usually called kandidaatti/kandidat. Other first-cycle university degree titles are oikeusnotaari/rättsnotarie (law) and farmaseuttil/farmaceut (pharmacy). The degree comprises basic and intermediate studies in the major subject, including a Bachelor's thesis; studies in one or more minor subjects and language studies.

The second-cycle university degree usually consists of a total of 160 to 180 credits or a first-cycle degree of at least 120 credits plus 40 to 60 credits (minimum of 5 years of full-time study or 2 years of full-time study beyond the first-cycle degree). This degree is usually called maisteri/magister. Other second-cycle university degree titles are diplomi-insinööri/diplom ingenjör (Technology), oikeustieteen kandidaatti/juris kandidat (Law), provisori/provisor (Pharmacy), arkkitehti/arkitekt (Architecture). The degree in Medicine, Veterinary Medicine and Dentistry is called lisensiaatti/licentiate. In Medicine and Veterinary Medicine the degree consists of 360 credits (6 years of full-time study). The second-cycle university degree comprises an advanced study module and a Master's thesis.

Students can apply for doctoral studies after the completion of the relevant second-cycle degree. In most fields, a pre-doctoral degree of lisensiaatti/licentiat may be taken before the Doctor's degree. In general, the pre-doctoral degree takes approximately two years of full-time studies after the second-cycle degree. The full-time studies for the Doctor's degree take approximately four years after the second-cycle degree.

Polytechnic degrees

There is a national decree which defines the objectives, extent and overall structure of polytechnic degrees. The Ministry of Education confirms the degree programmes of the polytechnics, and within the framework of these regulations, the polytechnics decide on the contents and structure of their degrees in more detail. The polytechnics also decide on their annual curricula and forms of instruction.

The polytechnic degree (ammattikorkeakoulututkinto/yrkeshögskoleexamen) is a first-cycle degree, the extent of which is 140 to 180 credits (3.5 to 4.5 years of full-time study) depending on the study field. In all fields of study the curriculum comprises basic and professional studies, optional studies, a practical training period and a Bachelor's thesis or a final project.

During a 3-year pilot phase from 1.1.2002 until 31.7.2005 polytechnics offered second-cycle polytechnic degrees (ammattikorkeakoulun jatkotutkinto /påbyggnadsexamen vid yrkeshögskola). These degrees consist of 40 or 60 credits (1 or 1.5 years of full-time study). The second-cycle programmes were meant for polytechnic graduates with at least 3 years of relevant work experience after completing the first-cycle polytechnic degree. After the pilot phase, permanent second-cycle polytechnic degrees (ylempi ammattikorkeakoulututkinto/högre yrkeshögskoleexamen) were made part of the higher education structure as of 1.8.2005.